

**NORTH CAROLINA**  
**DIVISION OF AIR QUALITY**  
**Application Review**

**Region:** Raleigh Regional Office  
**County:** Halifax  
**NC Facility ID:** 4200007  
**Inspector's Name:** Will Wike  
**Date of Last Inspection:** 11/29/2016  
**Compliance Code:** 3 / Compliance - inspection

**Issue Date:** xx

<b>Facility Data</b>				<b>Permit Applicability (this application only)</b>			
<b>Applicant (Facility's Name):</b> KapStone Kraft Paper Corporation  <b>Facility Address:</b> KapStone Kraft Paper Corporation 100 Gaston Road Roanoke Rapids, NC 27870  <b>SIC:</b> 2621 / Paper Mills Exc Building Paper <b>NAICS:</b> 322121 / Paper (except Newsprint) Mills  <b>Facility Classification: Before:</b> Title V <b>After:</b> <b>Fee Classification: Before:</b> Title V <b>After:</b>				<b>SIP:</b> 02Q .0317 (Avoidance of PSD) <b>NSPS:</b> N/A <b>NESHAP:</b> N/A <b>PSD:</b> N/A <b>PSD Avoidance:</b> for SO <sub>2</sub> <b>NC Toxics:</b> N/A <b>112(r):</b> N/A <b>Other:</b> N/A			
<b>Contact Data</b>				<b>Application Data</b>			
<b>Facility Contact</b>		<b>Authorized Contact</b>		<b>Technical Contact</b>		<b>Application Number:</b> 4200007.16D <b>Date Received:</b> 10/31/2016 <b>Application Type:</b> Modification <b>Application Schedule:</b> TV-Significant <b>Existing Permit Data</b> <b>Existing Permit Number:</b> 01649/T61 <b>Existing Permit Issue Date:</b> 03/31/2017 <b>Existing Permit Expiration Date:</b> 12/31/2017	
Mike Knudson Environmental Manager (252) 533-6280 100 Gaston Road Roanoke Rapids NC 27870		Rob Kreizenbeck Vice President of Mill Operations (252) 533-6485 100 Gaston Road Roanoke Rapids NC 27870		Mike Knudson Environmental Manager (252) 533-6280 100 Gaston Road Roanoke Rapids NC 27870			
<b>Total Actual emissions in TONS/YEAR:</b>							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2015	62.50	1335.78	322.76	739.13	239.52	152.15	108.89 [Methanol (methyl alcohol)]
2014	72.13	1446.35	348.56	773.70	229.76	178.15	134.56 [Methanol (methyl alcohol)]
2013	400.71	1585.29	246.84	728.03	260.73	123.24	81.30 [Methanol (methyl alcohol)]
2012	818.21	1379.46	286.67	689.96	284.10	168.53	127.38 [Methanol (methyl alcohol)]
2011	880.80	1412.92	283.90	569.60	358.42	173.22	132.80 [Methanol (methyl alcohol)]
<b>Review Engineer:</b> Rahul Thaker  <b>Review Engineer's Signature:</b> _____ <b>Date:</b> June 21, 2017					<b>Comments / Recommendations:</b> <b>Issue:</b> 01649/T62 <b>Permit Issue Date:</b> xx <b>Permit Expiration Date:</b> xx		

**1.0 Purpose of Application**

KapStone Kraft Paper Corporation (KapStone) has submitted a Title V permit application to reset the existing PSD (Prevention of Significant Deterioration) avoidance limitation for SO<sub>2</sub> emissions from No. 1 Power Boiler PB1 (ID No. ES-11-CU-001).

## **2.0 Application Chronology**

October 31, 2016	DAQ received the application.
March 28, 2017	Discussed the application with the Permittee with respect to baseline actual emissions, look-back period, actual amounts of LVHC (low volume high concentration) gases currently controlled by lime kiln or PB1, and reasons for this request, etc.
April 1, 2017	Received rationale on use of 10-year lookback period and SO <sub>2</sub> emissions estimate, assuming all LVHC were routed to PB1 boiler for the selected baseline period.
May 24, 2017	Discussed the draft permit with the applicant.

## **3.0 Facility Description**

KapStone is a Kraft pulp and paper mill which makes brown paper stock. This paper stock is used to make cardboard and shopping bags, as per the DAQ's last inspection report dated July 15, 2016.

## **4.0 Statement of Compliance**

Will Wike of RRO inspected this facility on July 13, 2016. At that time, the facility "appeared to be operating in compliance with all permit requirements."

## **5.0 Permit Modifications/Changes**

### **5.1 Resetting the Existing PSD Avoidance Limitation for SO<sub>2</sub> Emissions from Power Boiler PB1 (ID No. ES-11-CU-001).**

In 1991, the Permittee applied for and was issued an air permit from the Division of Air Quality (DAQ) to use Power Boiler PB1 (ID No. ES-11-CU-001), as a back-up control device to the lime kiln (ID No. ES-09-PU-004), which is currently the primary control device, for controlling / destroying total reduced sulfur (TRS) gases from the digester system, evaporator group, and turpentine recovery group. The primary purpose of this 1991 application was to prevent uncontrolled venting of TRS emissions when the lime kiln was not available. During this permit revision, a limitation to avoid PSD (Prevention of Significant Deterioration) was included for SO<sub>2</sub> emissions from boiler PB-1 when burning (destroying) TRS gases at a level of not to exceed 35 tons per consecutive 12-month period.

The Permittee states that due to operational and lime quality issues associated with controlling TRS gases in the lime kiln, it is using the power boiler more often (since approximately 2-3 years ago); thus, making the boiler the primary control device instead of the lime kiln for controlling TRS gases. To provide operational flexibility, the Permittee proposes to readjust the above PSD avoidance limit, incorporating total SO<sub>2</sub> emissions from both fuel combustion and TRS gases destruction in PB1 boiler. Specifically, it proposes to establish a limit at a level corresponding to PB1 boiler's baseline actual emissions plus 39.9 tons per year to avoid PSD. The Permittee states that this reset for an avoidance limit is proposed in a manner that would have been allowed for in the original 1991 application (had the Permittee chose to set the limit based on total SO<sub>2</sub> emissions).

As per the Permittee, when the facility was not using the referred boiler as a backup control, it ran the scrubber water pH at 4.5, which corresponds to a typical removal efficiency of approximately 60 percent for SO<sub>2</sub>. Similarly, when it did use the boiler as a backup control device to destroy LVHC gases, the typical pH was 6.5 with the corresponding removal efficiency of 89 percent. Finally, when the facility was using the boiler as a primary control for LVHC gases (and lime kiln as a secondary control), the scrubber water pH was approximately 7.5 and the typical removal efficiency was between 97 and 98 percent. The information provided in Tables 1 and 2 below, illustrates the above statements from the Permittee.

Table 1 provides more recent data (2011-2016) on average pH of scrubber water, average SO<sub>2</sub> removal efficiency of scrubber, and amounts of pulp production and SO<sub>2</sub> emissions, when TRS gases were burned / destroyed in PB1 boiler:

**Table 1**

Year	Parameters		Pulp Production, ADTP per year			SO <sub>2</sub> Emissions, tons per year	
	Average pH	Average SO <sub>2</sub> removal efficiency of scrubber, Percent	When burning / destroying TRS gases in boiler PB1	Total (including when burning / destroying TRS gases in boiler PB1)	Fraction (or %) of time TRS gases burned in boiler PB1 (instead of lime kiln)	When burning / destroying TRS gases in boiler PB1	Total, assuming all TRS gases burned / destroyed in boiler PB1 (i.e., no TRS gases burned in lime kiln at all)
2011	6.48	88.14	51,043	454,413	0.1123 (11.23 %)	16.05	142.92
2012	6.46	87.85	53,794	466,014	0.1154 (11.54 %)	19.14	165.86
2013	7.66	96.4	383,144	472,103	0.8116 (81.16 %)	26.06	32.11
2014	7.68	97.92	455,457	476,365	0.9561 (95.61 %)	29.86	31.23
2015	7.48	97.80	478,047	494,748	0.9662 (96.62 %)	33.15	34.38
2016	7.47	97.78	487,884	502,567	0.9708 (97.08 %)	33.26	34.33

Table 2 provides 2007-2008 data (beyond the 5-year lookback period) on average pH of scrubber water, average SO<sub>2</sub> removal efficiency of scrubber, and amounts of pulp production and SO<sub>2</sub> emissions, when TRS gases were burned / destroyed in PB1 boiler:

**Table 2**

Year	Parameters		Pulp Production, ADTP per year			SO <sub>2</sub> Emissions, tons per year	
	Average pH	Average SO <sub>2</sub> removal efficiency of scrubber, Percent	When burning / destroying TRS gases in boiler PB1	Total (including when burning / destroying TRS gases in boiler PB1)	Fraction (or %) of time TRS gases burned in boiler PB1 (instead of lime kiln)	When burning / destroying TRS gases in boiler PB1	Total, assuming all TRS gases burned / destroyed in boiler PB1 (i.e., no TRS gases burned in lime kiln at all)
2007	6.46	87.83	38,950	433,297	0.0898 (8.98 %)	12.40	138.08
2008	6.48	88.13	53,404	437,834	0.1220 (12.19 %)	16.42	134.59
Average 2007-2008	6.47	87.98	46,177	435,566	0.1059 (10.59 %)	14.41	136.07

It needs to be noted that most of the data in Tables 1 and 2 above have been previously provided by KapStone to DAQ through quarterly reporting, pursuant to current PSD avoidance limitation in Section 2.1 I. 6. e.

With respect to resetting the existing SO<sub>2</sub> avoidance limit, the Permittee argues that no historical information is available either from DAQ or KapStone, regarding the actual emissions of PB1 prior to 1991, which is needed to accurately determine the baseline actual emissions. The Permittee further states that the 1991 application did not contain total SO<sub>2</sub> emissions for the boiler; because the Permittee sought a limitation covering SO<sub>2</sub> emissions only during burning / destroying TRS gases. Thus, the Permittee requests to use a comparable, consecutive 24-month period of 2007-2008, for establishing the baseline emissions for the boiler. This proposed period is outside the 5-year

window from the receipt of the complete application (November 2011 through October 2016), as required pursuant to NCAC 02D .0530 unless an earlier period is demonstrated to be appropriate. The Permittee contends that the period (2007-2008) does represent normal source operation due to the following reasons:

The Permittee believes that during the 10-year lookback period (from October 2016), the operations of the PB1 boiler and its associated venturi scrubbers were more representative of the operation of the boiler and the scrubbers following the 1991 permit application than the 5-year lookback period (from October 2016). Specifically, in 1991 and in 2007-2008, the power boiler was operating as a backup to the lime kiln for control of LVHC gases, rather than as a primary LVHC control device. In addition, within the 5-year look-back period, the power boiler was transitioning to be or had transitioned to be the primary control for LVHC gases. Moreover, as per the Permittee, scrubber pH levels in the 2007-2008 timeframe would have been like the operation in 1991 since the facility would not have been attempting to control LVHC gases in the power boiler more than about 10 percent of the time.

The DAQ has concluded that the 2007-2008 period is representative for determining baseline emissions for this application as no pulp production or SO<sub>2</sub> emissions data are available prior to 1991. Also, based on the statements made by KapStone and confirmed by the data provided in Tables 1 and 2 above, the above period does reflect an operating period like the post-1991 operating time (immediately after approval of 1991 application) with regard to control of LVHC gases by the boiler and the scrubber operation.

As can be seen in Table 2, the average SO<sub>2</sub> emissions when burning TRS gases in PB1 during the 2007-2008 timeframe is 14.41 tons/yr and the average percent of time the TRS gases burned in PB1 rather than lime kiln is 10.59 percent. Assuming that the TRS gases were burned in PB1 boiler all the time (i.e., 100 percent of time, for all pulp production) for this period, the associated SO<sub>2</sub> emissions would have been approximately 136 tons/yr.

DAQ believes that it would be appropriate to reset the existing SO<sub>2</sub> avoidance limit, assuming the TRS gases were burned / destroyed in the PB1 boiler 100 percent of time; because that scenario was part of the 1991 permit application approval. Specifically, the existing limit (less than 35 tons per year PSD avoidance limit for SO<sub>2</sub> when burning TRS gases) does not preclude the burning of TRS gases 100 percent of the time in the boiler even though the 1991 permit application stated that the boiler would be a secondary control to the primary control with lime kiln. Therefore, the DAQ proposes to reset the above avoidance limit to less than 136 tons per consecutive 12-month period when destroying TRS gases.

However, during the draft permit review (pre- public noticing version), the Permittee commented that it preferred to establish a revised PSD avoidance limit based on the total SO<sub>2</sub> emissions of power boiler PB1, not just the SO<sub>2</sub> emissions from destruction of the TRS gases. The Permittee argued that the PB1 boiler had become a primary control device for destruction of the TRS gases (instead of the lime kiln), since the air permit containing the current avoidance limit was issued in 1991. In addition, for reducing scrubbing liquid / chemical cost, the Permittee would like to manage all SO<sub>2</sub> emissions from the PB1 boiler under the PSD avoidance limit. The Permittee proposed to establish a revised limit, considering the baseline (total) SO<sub>2</sub> emissions for 2007-2008 period for the boiler, excluding the SO<sub>2</sub> emissions when destroying the TRS gases for the same year.

The DAQ will consider / treat the above operational change for primary control device from lime kiln to power boiler 1 for destroying the TRS gases as “modification” in the context of PSD and reestablish the avoidance of PSD limitation, based on total SO<sub>2</sub> emissions. However, this new limit can only be established based on the baseline emissions, determined from the lookback period of five years from the receipt of the complete application (i.e., 2011-2016). The DAQ cannot allow any other period (beyond five years) to determine the baseline emissions, as the boiler transitioned from becoming a secondary device to a primary control device for destruction of the TRS gases in the last five years, as per the data summarized in Table 1 above. For example, the power boiler clearly became a primary control from 2014 onwards (96 %, 97%, and 97% of total TRS gases destroyed using the PB1 boiler in 2014, 2015, and 2016, respectively).

Based on the above, the DAQ will use data for calendar years 2011 through 2016, to determine a revised PSD avoidance limit for PB1 boiler’s total SO<sub>2</sub> emissions as follows. Using the 24-month consecutive period of 2011-2012 for estimating the baseline emissions,

2011 actual (total) SO<sub>2</sub> emissions = 803.2 tons/yr  
2012 actual (total) SO<sub>2</sub> emissions = 749.9 tons/yr

Average of the above 24-month period will be 776.6 tons/yr. Subtracting the existing, less than 35 tons per year emissions limit (which is solely based on TRS gases destruction with no fuel combustion emissions), will lead to a new PSD avoidance limit of less than 741 tons/yr for total SO<sub>2</sub> emissions from PB1 boiler. In summary, the DAQ will revise the existing avoidance limit from less than 35 tons per consecutive 12-month period to less than 741 tons per consecutive 12-month period, accounting for total SO<sub>2</sub> emissions from PB1 boiler.

The current permit includes monitoring for total pulp production and scrubber pH, when TRS gases are burned in the PB1 boiler, and SO<sub>2</sub> removal efficiencies based on measured pH values. The permit also requires record keeping for (a) total pulp production monthly (b) scrubber water pH on at least daily basis, (c) average scrubber water pH for each of the rolling 12-month periods, and (d) SO<sub>2</sub> monthly emissions. Finally, the air permit requires for each reporting period the parameters for pulp production, scrubber water pH, and SO<sub>2</sub> emissions on a quarterly basis for each of the 12 month periods within the previous 14-months.

All the above requirements will continue to help assuring compliance with the new limit of less than 741 tons per consecutive 12-month period. But, they will be augmented with the following requirements, specifically for SO<sub>2</sub> emissions when burning various permitted fuels, (coal, No. 4 fuel oil, No. 6 fuel oil, or wood):

#### Monitoring / Recordkeeping / Reporting

- Monitor heat inputs for each fuel type whenever any fuel is burned.
- Use the emissions factors for various fuel types (coal and fuel oils) as determined to comply with the 02D .0516 provision.
- Use emission factor of 0.0106 lb/million Btu for wood firing.<sup>1</sup>
- Keep monthly records for total heat inputs for each fuel, calculated SO<sub>2</sub> emissions rates for coal and fuels oils and total SO<sub>2</sub> emissions, and total SO<sub>2</sub> emissions on 12-month rolling basis.
- Report on a quarterly basis the monthly heat inputs for each fuel for each of the 12-month periods within the previous 14-months.
- Report on a quarterly basis the SO<sub>2</sub> emissions rates for each fuel (coal and fuel oils).
- Report on a quarterly basis the total SO<sub>2</sub> emissions from PB1 boiler for each of the 12-month periods over the previous 14-months.

## 6. NSPS, NESHAPS, PSD, Attainment Status, 112(r), CAM

### NSPS

Not Applicable. The proposed modification is not expected to increase the hourly emission rate of any regulated air pollutant. Applicability under §60.14 "modification" is not triggered. Further, the modification does not involve any capital expenditure; hence, applicability under §60.15 "reconstruction" is not triggered.

### NESHAPS

The facility sources are currently subject to NESHAP Subparts S and MM requirements and the current permit includes all applicable requirements under these Subparts. The proposed modification does not change applicability to these NESHAPs.

### PSD and Attainment Status

Halifax County, where this "major stationary source" is located, is currently either in attainment of or unclassifiable for all promulgated NAAQSs. Refer to §81.334. The PSD program requirements (as included in NC's SIP-approved regulation in 02D .0530) apply to any major stationary source or any major modification in Halifax County.

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<sup>1</sup> Table 10.4 "Uncontrolled VOC, SO<sub>2</sub>, NO<sub>x</sub>, and CPM Emissions from Wood Combustion Units", *Compilation of Criteria Air Pollutant Emissions Data for Sources at Pulp and Paper Mills including Boilers – An Update to Technical Bulletin No. 884*, Technical Bulletin 1020, December 2013, National Council for Air and Stream Improvement.

The facility is an existing, 100-ton category, major stationary source "Kraft pulp mill". With respect to PSD applicability, refer to Section 5.1.

#### **112(r)**

The facility is currently not subject to Section 112(r) requirements.

#### **CAM**

Through the processing of renewal application (4200007.11A) and issuance of air quality permit (01649T53), the Permittee has satisfied the CAM requirement for emissions unit PB1 for emissions of PM<sub>10</sub> and SO<sub>2</sub>.

### **7. Facility-wide Air Toxics**

This application does not trigger an air toxics program review under 02Q .0700 "Toxic Air Pollutant Procedures".

The current permit includes approved emissions rates for various pollutants for several sources, except for the sources subject to any NESHAPs (e.g., digester system, stripper system, evaporator group, etc.) and Section 112(j) subject sources (such as PB1 boiler). Consistent with 02Q .0702(a)(27), air toxic emissions from NESHAP (Parts 61 and 63) and §112(j) subject sources are exempt from requiring an air permit. In addition, as per the Permittee, the DAQ has determined that facility-wide emissions do not present an unacceptable risk to human health.

### **8. Facility Emissions Review**

The following Table includes facility wide actual emissions are for calendar year 2015, as reported to the DAQ.

<b>Pollutant</b>	<b>Actual Emissions tons/year</b>
Particulate (TSP)	415.96
Particulate (PM-10)	239.52
Particulate (PM-2.5)	184.66
Carbon Monoxide	739.13
Nitrogen Oxides	1335.78
Sulfur Dioxide	62.50
Volatile Organic Compounds	322.76
GHG as CO <sub>2</sub> e	Not Available
Single Largest HAP	108.9 (methanol)
Total HAP	152.2

### **9. Public Notice/EPA and Affected State(s) Review**

The changes proposed in this application are processed using a "one-step" procedure in 02Q .0501(c)(1) as a "significant modification". All Part 70 requirements for public participation will be satisfied as below:

Pursuant to 15A NCAC 2Q .0521, a notice of the DRAFT Title V Permit will be placed on the DEQ website. The notice will provide for a 30-day comment period including an opportunity to request for a public hearing. A copy of the public notice will be sent to persons on the Title V mailing list and the EPA. Pursuant to 15A NCAC 02Q .0522, a copy of the permit application and the proposed permit (in this case, the draft permit) will be provided to the EPA, for their 45-day review. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit will also be provided to

each affected State on or before the time notice will be provided to the public under 02Q .0521 above. A copy of the final permit will be provided to the EPA upon issuance as per 02Q .0522.

## 10. Stipulation Review

The following changes were made to KapStone Kraft Paper Corporation's Air Quality Permit No. 01649T61:

Old Page No. Air Quality Permit No. 01649T61	New Page No. Air Quality Permit No. 01649T62	Condition Number	Changes
27 31	27 31	Section 2.1 I. Table	Revise the SO <sub>2</sub> avoidance limit from less than 35 tons per consecutive 12-month period when burning TRS gases to less than 741 tons per consecutive 12-month period.  Revise applicability for 2D .0614 to add pollutant PM <sub>10</sub> .
28	28	Section 2.1 I.1.c.	Clarify that the monitoring for scrubber liquid flow rate and pressure drop is continuous. Remove the language for three days of absent observations per semi-annual period, as it was an error.
31, 32	31, 32	Section 2.1 I.6.a., c., d. and e.	Revise the SO <sub>2</sub> avoidance limit from less than 35 tons per consecutive 12-month period when burning TRS gases to less than 741 tons per consecutive 12-month period.  Revise monitoring section to require the Permittee to monitor heat input for each fuel type and SO <sub>2</sub> emissions rates for each fuel (coal and fuel oils), and use of emission factor when burning wood.  Revise recordkeeping section to require the Permittee to keep monthly records for total heat input for each fuel type and SO <sub>2</sub> emissions rates for each fuel (coal and fuel oils), and total SO <sub>2</sub> emissions for each month and each rolling 12-month period.  Revise reporting section to require the Permittee to report each quarter total heat input for each fuel type and SO <sub>2</sub> emissions rates for each fuel (coal and fuel oils), and total SO <sub>2</sub> emissions for each month and each rolling 12-month period.
32	32	Section 2.1 I.7.	Revise the heading for applicable regulation to include 02D .0614.
32	32	Section 2.1 I.7.b.	Clarify that the section applies to SO <sub>2</sub> , PM <sub>10</sub> , and opacity.

## 11. Conclusions, Comments, and Recommendations

- The application does not include a request for a permit to construct and operate a new source or a modification to any existing source. Therefore, requirements in 02Q .0112 "Applications Requiring Professional Engineer Seal" do not apply.

- The changes requested in the application do not result in an "expansion of an existing facility". Therefore, a local consistency determination is not required pursuant to 02Q .0507(d)(1).
- The draft permit was emailed to KapStone on May 12, 2017 for review. During the conference call on May 23, 2017, the applicant provided an editorial comment on the draft permit, asking replacement of “while” with “from” in Section 2.1 I.6.a. In addition, the Permittee submitted another proposal to rewrite the existing avoidance condition for SO<sub>2</sub> emissions, to incorporate the total SO<sub>2</sub> emissions when burning TRS gases and when fuel is combusted in PB1 boiler. This new proposal is discussed in Section 5.1 above.
- The draft permit was emailed to the regional office on May 12, 2017 for review. Charles McEachern from the RRO emailed on May 17<sup>th</sup> with no comment and recommended issuance of the revised air permit.
- This permit engineer recommends issuing the revised permit after expiration of public comment and EPA review periods.